

**Agricultural Led Food Security and Economic Growth:
Themes for the ANE Region**

April 2002



**U.S. Agency for International Development
Bureau for Asia and the Near East
Strategic Planning, Operations, and Technical Services**

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List of Acronyms

ANE	Asia and Near East Bureau (USAID)
DA	Development Assistance
EPA	U.S. Environmental Protection Agency
ESF	Economic Support Funds
FAO	Food and Agriculture Organization
FY	Fiscal Year
GDA	Global Development Alliance
GNP	Gross National Product
GDP	Gross Domestic Product
NGO	Non-Governmental Organization
OPEC	Organization of Petroleum Exporting Countries
SPS	Sanitary and Phytosanitary
TA	Technical Assistance
UNICEF	United Nations Children’s Fund
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
USG	United States Government
USTR	Office of the United States Trade Representative
WTO	World Trade Organization

Executive Summary

This document presents a framework for renewed engagement in agriculture by the Bureau for Asia and the Near East (ANE). It makes a case for expanding ANE's investments in agriculture, and explores linkages to other rural sectors. Finally, it recounts recent ANE activities in the sector and offers a menu for future expanded interaction that has commonalities for the whole region and specificity for the sub-regions. Issues specific to Afghanistan are not addressed here, but rather, will be dealt separately.

Promoting agricultural development is an indispensable means for increasing both food security and economic growth in most ANE countries. Being a dominant activity in rural areas, agriculture also cuts across various rural sectors, influencing natural resource management, private sector development, health and nutrition, and conflict prevention.

Stability and growth in the Middle East/North Africa is of vital economic and political importance to the U.S. East Asia is already a major U.S. trading partner. South Asia with its large population is a huge potential market, and recent geopolitical developments, including the terrorist attack on September 11, 2001, have thrust the sub-region into the spotlight. Thus, investing in the ANE region serves U.S. strategic, humanitarian, and economic interests.

South Asia is home for 37% of world's undernourished. The corresponding figures for Southeast/East Asia and the Near East are 28% and 5% respectively. Agricultural productivity gains that were spurred on by the Green Revolution have begun to slow down, and there is danger it being outpaced by population growth – the absolute number of people below the poverty line in South Asia today is higher than it was three decades ago. At the same time, average incomes, and associated tastes and preferences for higher value food items are on the rise across the ANE region, presenting a different set of issues.

Agricultural growth has been an important precursor to overall economic growth in most ANE countries. In those countries that did performed more poorly, the failure stems in large part from policies that restricted equitable distribution of gains from agriculture, poor infrastructure, and protectionist policies that constrained agricultural development from transcending into broad-based economic growth.

In order to fully exploit the potential gains from agriculture, programs in policy reform, biotechnology, water management, information technology, WTO accession, and environmental sustainability are seen as prudent investments for the overall ANE region. Reflecting the intrinsic regional differences under the ANE umbrella, the framework also puts forward individual sub-regional interventions. The focus in the Near East is placed on agriculture sector policy reform, water management, and market access; in South Asia on food security, water management, and removal of government interventions; and in East Asia on promoting effective trade reaching pre-crisis levels and institutional reform.

Given the limited availability of USAID resources, the challenge is to develop new ways of doing business that selectively address critical issues while developing partnerships with the private sector and other interest groups resulting in mutually beneficial gains that are public and private.

I. Introduction

Agricultural production is determined by the prevailing physical, policy and social environments. Physical and environmental conditions—soil, water, weather—constrain the types of possible agriculture activities. Government policies have strong (dis)incentive effects on agriculture. Social interactions among different groups and competing interests affect the development and functioning of markets and trade, and the general performance of the agricultural sector.

In today's evolving global markets—marked by increasingly free movement of goods, capital, and information across boundaries—many of the countries in the ANE region have established themselves as major players, while others show obvious potential. This dynamic should be seized to harness a sector that has the potential for economic and social gains. Agriculture is a driving force that is well suited to navigate in this global environment while delivering the means to achieve the twin objectives of food security and economic growth.

A. Food Security

Overview

The concept of “food security” has evolved over time, and consists of over 200 definitions and 450 indicators. Today, the general consensus is that people are food secure when they have timely access to suitable food at the desired quantities. USAID's definition states food security is attained: “when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.” It also notes that “three distinct variables are central to the attainment of food security: availability, access, and utilization.”

- *Food availability* occurs when sufficient quantity of appropriate food is consistently available for all. This could be through domestic production (at the household or in other parts of the country), or through external sources (from imports and food aid).
- *Food access* relates to when all individuals within a household have the necessary income or other means to obtain adequate food. Income and prices, together with distribution affect this variable.
- *Food utilization* focuses on the bodies' biological use of food for energy and nutrients. The availability of drinking water, sanitation and healthcare facilities, together with knowledge on nutrition, child care and food storage/processing are influencing factors.

The concept of food security also has spatial (degree of aggregation) and temporal (time frame) dimensions. Food security can be analyzed from at the individual, household and other degrees of aggregations all the way up to the global level. It can also be looked at during different time frames. Chronic food insecurity is inability to meet food needs on a continuous basis, while transitory food insecurity is a temporary condition. Transitory food security can be further classified as cyclical (seasonal) and temporary (exogenous shock).

Household resources/endowments consist of labor and capital. Labor includes physical capacity and knowledge or social wisdom. Capital consists of land, tools and financial resources and other tangible assets. Household income is determined by the return of these endowments

allocated toward the production of food, cash crops and/or non-farm income generating activities, together with transfers from outside sources such as neighbors, government etc. This income can be spent on food and non-food items – choice determined by prices, priorities, social customs etc. (Thus, poverty indicators are not necessarily a perfect measure of food security). Individual food security is determined by type, quantity and sanitary/healthy environment in which the food is consumed.

Food security in Asia

Seventy per cent of the 792 million undernourished people in the world live in the ANE region—a reflection of Asia's large share of global population. Broken down by sub-region, 28% fall in East and Southeast Asia, 37% in South Asia, and only 5% in North Africa and the Near East (see Table 1). Although average per capita food consumption has increased, projections indicate that up to 141 million children could be malnourished in Asia by 2010. It is important to note that the rise in per capita caloric intake is mainly due to increases in cereal consumption, and does not necessarily reflect improvements in overall nutritional intake. Studies in Bangladesh have shown that although declining prices of the staple food (rice) led to its increased consumption, rising prices of non-staples (fruit, vegetables, legumes, fish/meat) resulted in severe constraints to improving dietary quality of the poor (Bouis, 2000).

Regional trends in Asia are dominated by the performance of India—by far the most populous of the group. Agricultural output per hectare grew at the annual rate of 3.3% (twice the U.S. and world average rates), fueled by high use of inputs and irrigation. While the projected outlook for the future appears good, those within the lowest income group will not be able to purchase adequate food. Indonesia was hit hard by the financial crisis in 1997. GDP declined by 14% in 1998 and by a further 4% in 1999. Wheat consumption declined 50% from 1996 to 1998, and food aid shipments of 1 million tons in 1998 and half a million tons in 1999 were instrumental in preventing famine. While the economic situation improved moderately in 1999, the current political and economic situation is unstable. Of the countries studied in the region, Afghanistan and North Korea account for the entire nutritional food gap. (66 and 33 percent respectively). Even under high growth scenarios, these countries are not expected to provide adequate food for their populations (USDA/ERS, 2000).

Demand for food in the ANE region is expected to grow due to overall population increase and higher per capita consumption. The affluent segments of the population are increasingly demanding higher value food items such as wheat, livestock products, processed foods, and fresh fruits and vegetables. In Asia, per capita increase in demand for meat grew from 2.4% between 1967-1982 to 5.9% between 1982-1985. In addition to changes in the quantity of livestock consumed, demand for feed-grains will also increase. Each unit of livestock produced for consumption requires between 2-7 times as much grain for feed.

The food security crisis which was expected to be triggered by Asia's population explosion in the last three decades was primarily averted by even higher rates of agricultural growth related to the Green Revolution. However, recent data shows that yield increases (especially rice) have stagnated, with agricultural growth tapering off. New approaches (together with better application of existing technology) are necessary to maintain existing rates of growth and accommodate changing tastes and demands. In addition to new approaches, decreasing poverty

is central in addressing the ‘access’ to food. Increased agricultural production offers a means for raising incomes in rural areas through direct and indirect effects. It also tends to keep food prices low, raising the real income of the poor.

Food security in the Middle East & North Africa

Food production in the Middle East and North Africa region is characterized by a scarcity of physical resources, especially water, that limit output under current conditions; heavy dependence on groundwater for irrigation; and highly variable output patterns due to erratic rainfall. For example, serious drought in 2000 resulted in more than 50% reduction in agricultural production compared to historical trends in Algeria, Tunisia and especially Morocco. However, the ability to import food has lessened the blow to food security in these countries. In addition, due in part to the policy of subsidizing staple foods, Egypt, Tunisia and Morocco successfully protect the food security of the low-income consumers. Although the lowest quintile income group in Algeria is not meeting its nutritional requirements, projections through 2010 indicate that MENA countries should have little problems meeting their overall nutritional requirements. (USDA/ERS, 2000)

With a high reliance on imports for their food security, it is important that the countries in the region have a dependable source of foreign exchange. Oil and gas—through direct exports or through remittances from expatriates working in OPEC countries—are important sources of revenue, and price variations in the world markets have repercussions for food security back home. In addition, rising prices of non-staples (fruit, vegetables, legumes, fish & meat) is beginning to adversely affect the nutritional quality of the poor.

B. Economic Growth

Beginning in the 1960s, economic growth took off in many Asian countries—especially in East and Southeast Asia. More recently (1980-95) we see three clear groupings. In the first are the countries of East and Southeast Asia which grew rapidly—led by China at over 10% growth followed by Indonesia, Korea, Malaysia and Thailand. Vietnam also joins this group posting 7.8% annual growth over this period. South Asian countries fall into the second group posting relatively healthy growth rates between 5.8 to 4.3 percent, led by Pakistan and India, and followed by Bangladesh, Nepal and Sri Lanka. The third group consists of the stragglers, Burma and the Philippines, posting 2.9 and 1.9 percent respectively.

Agricultural growth has been the precursor to the industrialization and overall economic growth in most of the Asian countries (with the city-states of Singapore and Hong Kong being the exceptions). Domestic investment (infrastructure, irrigation) together with technology input from international research institutions resulted in an agricultural boom. The green revolution was ushered in by the wide dissemination of technical packages consisting of high-yielding variety seeds, fertilizer and pesticides. Because of its relative size, productivity gains in the agriculture sector have economy-wide reverberations.

This agricultural transformation possessed several factors contributing to economic growth. As identified by Rosegrant and Hazell (2000), they are:

- First, it raised the living standards and incomes of the rural population, which in turn created increase domestic demand for non-agricultural goods/services.
- Second, efficiencies in the agriculture sector made it possible to release cheap labor for the industrial and service sectors.
- Third, a growing agriculture sector provided capital to finance the non-agricultural sector through rural savings, and direct taxation on land, commodities, etc., and indirectly through turning the terms of trade against agriculture.
- Fourth, processing and marketing of agricultural products provided managerial skills and capital for agribusiness firms to branch out or provide synergies with new firms entering into the industrialized sectors.
- Fifth, through increased exports and reduced imports, agricultural growth secured important foreign exchange, which was used toward furthering domestic industrialization.

Studies linking agriculture and the rural non-farm economy in Asia estimated that for every unit of value added in the agriculture sector, the regional rural nonfarm sector correspondingly increases in value between one and a half to two times. Looking at the period 1970-95, we see a clear positive relationship between the growth of agriculture and that of the combined manufacturing and service sectors (Figure 1). At the high end of the relationship is China posting impressive growth, while Bangladesh and the Philippines are low performers. Korea is the outlier to this trend, where growth in manufacturing and services took off with a less forceful accompanying increase in the agriculture sector. This is explained by the structure of the industrial sector organized in large complexes and concentrated in a few urban centers, export driven demand, and capital financed through large inflows.

Not all countries that experienced the agricultural revolution followed it up with an industrial revolution. India and the Philippines are cases in point. In the Philippines, the gains from agricultural growth were not distributed equitably, resulting in the rich getting richer with the poor being squeezed out. In addition, the rural infrastructure in the Philippines has not been well developed. In India, although agricultural growth was relatively equitable and its infrastructure adequate, inward looking protectionist measures were detriments to growth. With its recent reversal in trade and macro policies, India is currently experiencing GNP growth that's double that of past decades.

For agricultural growth to translate into overall national economic growth, the following conditions have to be met:

- *Equitable agricultural growth.* Studies have shown that incremental income in the hands of small and medium size farmers leads to larger growth multipliers than if it were siphoned off to only the rural elite. In turn, equitable agricultural growth depends on equitable distribution of land with secure property rights, use of scale-neutral technologies, and equitable access to inputs & services.
- *Developed rural infrastructure.* In addition to connecting the rural areas to the markets for the transport of agricultural inputs and outputs, a well-developed infrastructure increases access to non-farm goods and develops demand linkages.
- *Open market economic policies.* Protectionist policies and overvalued exchange rates impede the development of competitive, export-market oriented domestic industries.

Designed to restrict imports, these policies end up preventing exposure to new technologies that have the potential to raise factor productivity, making the domestic industries noncompetitive internationally.

In the MENA countries, improved agricultural productivity has the potential to play an important role in overall economic growth. It does so by increasing foreign exchange earnings through export of high value agricultural products, reducing the burden of importing food, and generating employment through direct and indirect effects—which has special significance for the MENA region coping with high unemployment.

One of the most important issues in the MENA surrounding agriculture and economic growth is the inefficient allocation of resources to the former resulting in the hindered development of the latter. Even though Agriculture's current share of GDP is relatively low—13% in MENA, 17% in Egypt—significant portion of government revenues in the MENA go toward inefficient irrigation schemes and subsidies for livestock and preferential agriculture programs. Focusing on greater productivity rather than increasing area under production, improvements in water-use efficiency and livestock programs, and getting policies right in the form of reduced government intervention will free up resources that can be better spent on more profitable agriculture endeavors and on other economic growth activities.

II. Cross-Cutting Themes

A. Natural Resources and the Environment

Only 30% of the surface area in the Middle East/North Africa is suitable for agriculture; the rest is covered by desert and arid lands. Without further irrigation, there is virtually no spare land available for agricultural expansion in this region. Limited access to land is further exacerbated by land degradation and desertification in the majority of Near Eastern and North African countries. However, it is water, not land, that is the limiting factor for agriculture in the MENA region. The MENA region is the driest in the world. The region is poorly endowed with water and a number of countries are already overexploiting their existing groundwater resources. Agriculture consumes more than 80% of the available water, and most MENA countries face chronic water shortages. Moreover, opportunities for new irrigation development are limited as the accessible water sources have already been tapped and the remaining sources are expensive to develop (with the possible exception of recycled wastewater). Given that farm irrigation efficiencies are typically only 50%, improving efficiency and productivity (i.e., “more crop per drop”) are the new goals for improving the use of water in agriculture.

Agriculture in Asia faces a similar situation, with 80% of Asia's arable land already under cultivation and water shortages are looming. Under such constrained resource bases, improved, efficient production practices and technology-induced increases in productivity are critical to sustain current and future demand.

In South and Southeast Asia, it is estimated that 27% of all land degradation and 11% of deforestation is directly related to agriculture. Unsustainable cultivation practices that lead to soil erosion and loss of habitat, encroachment into protected areas, and loss of biodiversity due to

monoculture are some of the environmental consequences of agriculture. Irrigation-induced soil salinity and waterlogging are significant environmental problems in Asia. In no small part, this was due subsidized irrigation (a contributing factor to the success of the Green Revolution) which provided little incentive for water conservation. While fertilizer use is relatively high in most of the Asian countries, there is scope for increased application—with a few exceptions in areas such as Indonesia’s West Java, Indian Punjab, and parts of China where rates of application are artificially high due to subsidies. Associated with high fertilizer use is nitrogen runoff that could potentially contaminate drinking water, and also cause the undesired proliferation of organisms that deplete oxygen and choke waterways. Similarly, improper use of pesticides has health and environmental consequences.

B. Private Sector & Enterprise Development

Marketing of surplus agriculture is the first step toward moving away from subsistence farming, and toward entrepreneurship. In addition, processing, marketing, and other ‘value-added’ activities of food and cash crops have the potential to generate even higher levels of disposable income for the farming households. This income is then spent and invested in other non-farm sectors—which in turn generates employment and income, becoming the impetus for rural economic vitalization. Institutions and skills that support agriculture (infrastructure, microcredit, information, technology adoption and organizational skills) have positive externalities as they are also relevant for the development of other private sector endeavors.

C. Governance and Democracy

Increased agricultural production lends itself to joint management (e.g., water user associations) and marketing efforts and the organization of farmers into production and sales associations. These agriculturally based organizations are often the first and only exposure the rural population have to group decision making, resource management, and self governance. These organizations can grow into effective agents for democracy and good governance at local and national levels.

D. Education, Health, Gender

As agriculture—the largest sector in rural areas—develops and becomes more efficient, human resources that it once commanded become available for investment in other economic and social activities. Newly available time, together with additional income gained through agricultural commercialization, may be applied toward education, organization and participation in civic society, healthcare, and a host of other activities. Women—who juggle household and fieldwork and consistently score low on social indicators—are provided opportunities to engage in family healthcare, income generation, leisure, and to achieve a greater degree of empowerment. Essentially, rural agricultural development provides an avenue to climb out of the perpetual hand-to-mouth existence. It is also being argued that increases in rural income reduces migration in search of employment, thereby lessening the spread of diseases including HIV/AIDS in select populations. Similarly, rural income generating agriculture could also potentially have the effect of reducing the trafficking of women and children from rural areas.

E. Conflict Resolution and Security of Tenure

In many areas of the ANE region (e.g., the Middle East, India-Pakistan, Mindanao in the Philippines) conflict prevention/mitigation is an overarching USAID objective. Economically secure societies are generally less likely to initiate conflict. Agriculture is well positioned to be a vehicle that provides food, employment and disposable income, thus mitigating flare-ups over resources. Secure rights and established markets for land and water are important factors in preventing resource related conflicts, which destabilizes communities and in turn leads to more conflict.

In addition, it is only with secure property rights that farmers have the incentive to shift away from exploitative practices for short-term gain, and to start investing in the land with the expectation of long-term returns. The flexibility of moving resources and allocating them according to what is most profitable depends on functioning markets for these resources. Finally, secure land rights provide an avenue for using land as collateral to raise credit necessary for agricultural productivity enhancing investments.

III. USAID Programs and Experiences

Funding for agriculture in the ANE (excluding food aid) has steadily declined from \$300 million in the early 1980s to slightly over \$100 million today (see Table 2). The ANE Bureau is currently engaged in a variety of agriculture-related activities. In FY 2001, \$108 million of Bureau allocations went for agriculture, with \$95 million of this funded through ESF. ESF funds were directed toward Egypt (\$63 million), Jordan (\$15 million), Lebanon (\$6 million), Philippines (\$3 million) and East Timor (\$8 million). In Egypt, these resources support agricultural policy reform, agribusiness development, and increased export competitiveness for agricultural products. Funding in Jordan supports improved water resource management, while in East Timor USAID is funding the development of coffee cooperatives. In Lebanon, ESF resources are supporting rural development, including rehabilitation of agricultural infrastructure (farm-to-market roads, irrigation), assistance to agricultural cooperatives, and livestock improvement. In the Philippines ESF supports rehabilitation of combatants in Mindanao.

DA funding for agriculture is more limited due to the overall scarcity of economic growth funds. In Asia, DA funding is used for: improving agricultural policy in Indonesia; supporting growth of agribusiness and improved management of aquatic and tropical forest resources in Bangladesh; encouraging adoption of higher value farming/fishing products and techniques in Mindanao, Philippines; and supporting increased sustainable production of forest and high value agricultural products in Nepal.

In addition, other programs not strictly coded as such, nevertheless deal with agricultural issues in ANE. For example, USAID/Philippines Coastal Resource Management Program is improving local food security by working with communities to sustainably manage their fish and other seafood resources. In Morocco, water management programs falling under the environmental classification mainly benefits the agriculture sector. Furthermore, USAID pillar bureau programs funding research in biotechnology and integrated pest management are also operational in selected ANE countries.

Sizable agriculture/food security programs have also been implemented through proceeds from food aid (P.L. 480, 416[b]) administered by USAID and USDA. In 1999 (a significantly above-average year) total U.S. food aid was \$2.4 billion, and ANE's share administered by USAID (P.L. 480 Titles I & II) amounted to roughly \$270 million. Lebanon has been a recipient of substantial USDA 416(b) resources (\$9.9 million from FY 2000 proceeds). Bangladesh and India have been the recipients of large food aid programs, and these programs, through mechanisms such as monetization and Food-for-Work, have supported a variety of agriculture related projects. While providing significant support for agriculture/food security initiatives in select countries, these sources of funds are variable over the years and are limited in the ways they can be used by the missions.

Funding directives for the whole Agency in 2002 are: \$30 million for Biotech; \$22 million for Collaborative Research Support Programs (CRSPs); \$8 million for Dairy; \$27 million for the International Research Centers (which has an additional buy-in of \$20 million by the AFR Bureau). Many of the agriculture options proposed for ANE are well suited to build on these earmarks.

IV. New Developments

A. Changing Role of Agriculture

Overall economic growth in Asian countries has brought about a reduction in agriculture's relative share of GDP (Figure 2). This relationship reflects several factors: as incomes increase, the share of expenditures on food relative to other goods declines (Engel's Law); technical infusion is faster in the non-agricultural sectors; and as capital accumulates, the share of output from labor-intensive agriculture declines relative to capital-intensive non-agriculture sectors. In an ideal situation, as a country engages in other income generating sectors, agriculture's role will diminish to the point where food demand is being met most economically—through domestic production or imports. The danger here is to ignore agriculture to the extent that its income generating potential is unfulfilled.

As a country goes through economic transformation, agriculture's relative share of overall exports also tends to decline, and the agriculture sector becomes more commercialized. In addition, the rate of reduction in agricultural labor does not keep pace with that of its GDP share, leading to reduced productivity in the rural sector. This situation can lead to social unrest in the rural areas and encourages governments to provide subsidies to the agriculture sector. In order to avoid this unsustainable situation, it is necessary to promote the migration of agricultural labor into other sectors through economic diversification of rural areas, commercialization and value-added endeavors, and diversification into high-value crops.

B. Rising Inequalities

Even as Asia achieved high economic growth and overall poverty reduction over the last three decades, studies show a few countries also exhibited rising inequalities (World Bank, 1997). This was especially true for China and Thailand, and to a lesser degree for South Korea and the

Philippines. The primary reason for this trend is the concentration of economic activity in certain geographical areas at the exclusion of others. This has led to widening income disparities between regions of a country and between rural and urban areas. This type of inequality festers resentment and provides a breeding ground for conflict and separatist aspirations. This is also true in the Near East where inequalities across geographic areas, and urban bias in national expenditure plans are evident. While the central goal of absolute poverty reduction has been achieved in the ANE region, a secondary goal of equitable distribution is still lagging. Further studies are needed to better understand the magnitude, dynamics and implications of this phenomenon.

C. Democratization and Decentralization

Many of the countries in the ANE region have seen governments installed through an increasingly democratic process, or through a changing of the guard with more open-economy minded leaders taking over. Not unrelated is the decentralization process taking place in a number of countries (Indonesia, Pakistan), empowering district and local governments. USAID is well positioned to provide strategic input to help with a smooth transition, leading to agricultural growth and economic/social vitalization.

D. Globalization & the WTO

Many countries in Asia (especially East/Southeast Asia) are well integrated in the global economy. India is a regional power in South Asia and poised to become a major player globally. Similarly in the Near East, Egypt is a significant presence with economic implications beyond its borders. Market-oriented policies have resulted in economic growth of many of these countries. However, as the Asian financial crisis in 1997 indicates, there are associated risks. Sound financial institutions, banking regulations, transparency and enforceable laws should be in place to exploit the gains from globalization while avoiding the pitfalls of economic shocks and resulting capital flight.

The WTO-related negotiations have a special emphasis on global agriculture. Issues such as multifunctionality, export subsidies, environmental regulations, intellectual property rights, quotas for textiles, fruits etc. have explicit repercussion for agriculture and trade. Thus, the ability to analyze, negotiate, and transform—the capacity to function in such a global economy—is essential for many of the developing countries in and outside the ANE region.

E. Climate Change

There is growing evidence that greenhouse gases accumulating in the atmosphere are causing climate change. Temperature, precipitation, soil moisture and sea levels are being affected. Agriculture accounts for approximately one fifth of man-made greenhouse emissions, chiefly through flooded rice cultivation, improper soil management, land conservation, biomass burning, and livestock production. Agricultural deforestation also destroys forests and woodlands that function as carbon sinks that trap greenhouse gases from reaching the atmosphere.

Agriculture is also affected by climate change. While overall global agricultural production may not be significantly affected due to positive and negative effects of increases in temperature and

atmospheric CO₂ levels, regional changes that may take place are of concern. Tropical, mid/lower latitude regions—where most of the world’s poor live—could be adversely affected by reduced rain, soil erosion, desertification due to more intense rainfall and droughts, increased pest/disease infestations, and flooding and soil salination in low-lying areas. Areas that are already drought prone are made even more susceptible, and low-income populations dependent on isolated agricultural systems and pastoralists are especially vulnerable to even the slightest changes in weather patterns.

V. Emerging Opportunities

A. Biotechnology

Conventional plant breeding together with biotechnology is seen as a realistic avenue for productivity increases. This has special relevance for Asia—which has an edge on institutional capacity in this field relative to other regions of the developing world. Biotechnology has currently resulted in improved pest resistance, tolerance to adverse weather, higher yields, and introduction of nutritional compounds (e.g., vitamins, amino acids) into the crops. The private sector has taken the lead in biotechnology in the developed world, and while this currently seems to be also true in Asia, there is clear potential for government’s collaboration in this area.

In order to fully exploit the technological advances in this area, Asian countries will have to develop “homegrown” varieties that are suitable for specific climates and tastes. In addition, attention must be placed on protection of intellectual property rights—which unless addressed appropriately could lead to disincentives in research, loss of ownership of indigenous genetic sources, and restrictions in sharing of genetic material by international research institutions.

B. Economic Liberalization

The opening up of domestic markets has been the precursor to accelerated economic growth in most countries. While countries like India followed protectionist policies while achieving a certain degree of growth and food security, they prevented the country from reaching its full potential. Recent reversals in India’s inward looking policies have begun to bear fruit in the shape of higher GDP growth. Reduction in trade restrictions, sound macro/fiscal policies, and reduction in government interventions are factors associated with economic liberalization. It is important to note that opening up of domestic markets also exposes the country to volatility in world prices—with agricultural commodities being very susceptible to sudden price swings in the global market. One possible means of protecting the agriculture sector from such price volatility of raw materials is to integrate along the value chain, engaging in processing, packaging and value-adding activities.

C. Sustainable Agriculture

Attempts at increasing productivity should consider the sustainability of the agriculture systems. Engaging in practices that damage the environment, and promoting economically unviable input use and cultivation of crops unsuitable for the specific localities (for climatic, edaphic, labor, or cultural reasons) could end up causing more harm than good. Means for intensifying production

through sustainable agriculture include the rehabilitation of degraded areas, addition of components such as fish in ponds or rice paddies, diversifying products including tree crops, agroforestry, and management of watersheds to maintain dry-season river flows and wetlands areas.

D. Research & Extension

Numerous studies have shown high economic rate of returns and favorable productivity gains due to agricultural research. Research in crops and cropping systems provide farmers with the opportunity and flexibility to move into profitable agricultural practices. With declining returns to inputs being shown in many countries, research is seen as providing an avenue to maintain the momentum. Research also facilitates diversification and commercialization in the rural areas by providing options for investment in the agriculture sector and increasing income generation and linkages with the non-farm sector.

A critical component in realizing the potential gains from research is the ability to get the knowledge from the experiment stations into the farmer's fields. In addition to traditional government extension agents, technology dissemination can be conducted by private sector sellers/buyers of inputs/outputs, credit agencies, and NGOs. Tools for dissemination include a range of mechanisms such as word of mouth, demonstration plots, rural fairs, and the mass media. Investment in research and extension is increasingly becoming a function of not only the government, but also of the private sector and civic organizations. Institutional reform should focus on the relationships between the public, for-profit, and non-for-profit sectors.

E. Information and Communication Technology (ICT)

Agriculture stands to gain through increased trade due to electronic/information technology. This technology makes engaging in e-commerce, hedging, and futures markets more viable through rapid information exchange, speedy decision-making, and lowered transaction costs. Communication from the field to the center on weather, pest, soil, road and price conditions facilitates prudent, timely feedback and decision making. ICT has the potential assist farm management, and adding value by rising the information content of agriculture products. Rural infrastructure and markets that can exploit ICT technology need to be developed. Modern innovations and lowering costs of technological devices provide the potential for positively affecting not only the bigger, well-connected farmers, but also the poorer more isolated ones.

F. Standards, Certification and Food Safety

With expanded trade come requirements for grades and standards, and phytosanitation control. These requirements are imposed by importing countries for various reasons including: prevention of the transfer of pathogens to humans, livestock and plants; environmental concerns; consumer tastes and preferences; and the protection of their own domestic industries. In order to be a player in the global market, exporting countries will have to build up capacity to meet these trade requirements. While expanded international markets provide opportunities for many agricultural exporters, they also negatively affects others. Due to technical or capital constraints, those who are unable to adapt rapidly will lose market share. In addition, certain certification requirements imposed by Western countries are not realistic given the exporting countries

economic, cultural and social makeup – and in reality function as trade barriers. Without collective organization and technical support, poor small farmers are most likely to be disadvantaged by these requirements (e.g., organic farming and need for certification).

G. Rural Financial Markets

As agriculture becomes more technical and commercialized, demand for investment and working capital increases. Dependable rural financial markets that provide reasonable competitive loans play a major role in speeding-up adoption of technology, expanding production, and increasing household income. The seasonal nature of agriculture also necessitates financial institutions that facilitate prudent farmer saving and investment behavior. Integrated financial systems can also help spread risk induced by volatile agricultural prices. Historically, government intervention through lending requirements imposed on banks, refinancing schemes, subsidized interest rates, credit guarantees, and lax repayment enforcement have adversely affected viable financial institutions. In order to reform, the government's role should only be in the creation of an environment that fosters competitive financial institutions. This may be accomplished through macroeconomic stability, low and stable inflation, procedures to enforce contracts, protection of property rights, and a regulatory/supervisory system that facilitates financially and legally sound transactions. Viable financial institutions have the potential to capture savings gained through agriculture and apply it toward non-farm sectors, helping to commercialize entire rural communities.

H. Management of Fish Resources

Food security is not only dependent upon farm production, but also on fish from freshwater and marine sources. It has been estimated that fish provide approximately 25% of the animal protein consumed in Asia and up to 80% of the animal protein of rural coastal communities. Overfishing, habitat destruction and land-based pollution have resulted in the alarming degradation of the coastal environment and the deepening of poverty in coastal areas. As a result, UNICEF's monitoring systems are now reporting protein-calorie deficiency in coastal communities. Riverine systems in Asia have become degraded through deforestation and dam construction. For example, a dam in the Mekong watershed reduced fish catches up to 80%. Inland fisheries in Bangladesh have declined by 40% over the past 30 years as the result of overfishing and wetlands drainage for agriculture. Empowering local communities to sustainably manage their coastal resources, as is being done in Indonesia and the Philippines, can contribute to local food security.

I. Livestock

In many parts of ANE rearing livestock is an important way of life (especially in the Middle East/North Africa and Mongolia), while India is one of the world's largest dairy producers. Livestock is an important source of cash income in rural areas, and it specifically contributes toward a larger share of income of landless rural poor compared to the better-off. It also allows the rural poor to utilize common property such as open grazing lands. In addition, livestock manure and draft power are important factors for sustaining soil fertility and intensifying farming systems.

As incomes increase, demand for higher value food items including livestock products (meat, dairy, eggs) is also expected to increase. For instance, in Asia, total demand for meat products grew from 4.6% during 1967-1982 to 7.9% during 1982-1995. This has implications for both the livestock sector and feed crops sector. As the demand patterns change and populations increase, it is clear that the low productivity of traditional smallholder animal husbandry is not sufficient. There is great potential for technology transfer—improved stock and better management practices—coupled with ensuring the availability of suitable feed, to meet this challenge.

As the livestock sector expands, it is important that focused efforts be placed on preventing the spread of disease to animals (e.g., foot & mouth disease), and humans (e.g., tapeworm). To meet SPS control standards for international trade there will be a need for capacity building to participate in standard setting in discussions led by Codex, OIE and IPPC. In particular the Codex standards for meat and poultry safety will be rewritten in the next 3-4 years, and this presents a unique opportunity for participation. High-intensity livestock production also poses environmental risks (e.g., waste contaminating water supply, greenhouse gas), and attention has to be placed to mitigate these negative externalities.

VI. Themes and Regional Variations

Owing to the intrinsic regional variations within the ANE region, the ANE agriculture framework treats the Middle East/North Africa, South Asia, and East/Southeast Asia separately, although with considerable overlap of core themes. Prospective interventions need to be classified as short/medium/long term, and evaluated for sustainability. Given the large multilateral and bilateral donor presence (especially in South Asia and Southeast Asia), USAID agriculture programs need to take into account the limited available resources and focus in those areas where USAID has a comparative advantage. Described below are general areas that are considered best suited for potential intervention.

Overall Areas of Focus for ANE

Many of the priorities and developing trends globally are also relevant in the ANE region. As such, the Bureau intends to focus on the following overarching themes. Close attention will be paid to gender-specific interventions in suitable areas.

Policy Reform

- Reduction of government interventions through pricing policies, quotas, etc. that distort the market and adversely affect agriculture.
- Trade promotion through the removal of formal and informal trade barriers, and assistance toward WTO accession.
- Promotion of technological packages that are scale neutral.

Biotechnology

- Assistance for programs that develop crops capable of increased yields, pest resistance, drought and salinity tolerance, etc.
- Biofortification (e.g., vitamin A, zinc, other micronutrients) through a combined biotech and classical breeding approaches.

- Strengthening of biosafety policies to address environmental sustainability and head off potential distortion of food trade in biotech-derived commodities.

Agribusiness & Value-Adding Processors

- Rural household incomes can be considerably increased by graduating from subsistence agriculture into value-added activities. Taking into account the prevailing country specific condition, assistance will be provided to promote activities such as: processing, high-value crops cultivation, product specialization, marketing, organizational behavior, and credit.

Water Management

- Support for the integrated management of water resources for irrigation and other uses to conserve resources, prevent degradation and mitigate conflict.

Institution Building

- Assistance for capacity building at the human resource and institutional levels through collaborative research between universities and research institutions, and through funding of degree and non-degree programs at U.S. universities.

Information & Communication Technology

- Fully exploit developments in interactive media and low-cost information dissemination technologies to level the playing field and promote wider participation in agricultural production, marketing, crop protection, and trade.

Grades & Standards

- Assist with the establishment of facilities and capacity that enforce grades, standards and food security measures to facilitate participation in global trade and enable WTO accession.

Sustainable Agriculture

- Provide assistance in agricultural technologies that reduce detrimental effects on the soil, water and air, protect biodiversity, and conserve forests, wildlife and fragile ecosystems.

Middle East/North Africa

ANE will continue to support agricultural sector development in the NE region. Key objectives include agriculture sector reform to spur growth, strengthened agricultural research and extension, improved management of scarce water resources, and development of agribusiness and value-added activities with an eye toward reaching European markets. Ongoing and possible future USAID activities include:

Policy

- Removal of trade barriers for increased access to markets in Europe & rest of world.
- Regional trade cooperation.
- Development of niche markets for agricultural produce.
- Assist with the making the highly subsidized livestock industry profitable and competitive.

Water and Irrigation

- Assistance focusing on water rights, efficient use, and water management at the local, national or regional levels.
- Support for restructuring irrigation tariffs and increasing cost recovery.
- Development of effective water user associations.

Capacity Building

- Support for agricultural research and grassroots activities to help improve financial services.
- Development of human, entrepreneurial, and managerial capacity.

- Judicial and regulatory assistance to ensure investors have legal recourse.

Information Technology

- Computerization and connection to the internet enabling participation in futures trading, strategic marketing, etc.

Quality Control

- Assistance with meeting grades and standards, SPS requirements.

Research and Biotechnology

- Engage in activities that are suitable for this specific climate and location.

South Asia

Reflecting the large population of under nourished in this region, the framework will focus on food security. In addition, given the relatively centrally controlled closed nature of the governments, policies that remove trade, investment and property rights will be encouraged. In India, pilot programs in select states may be conducted, for broader dissemination of lessons-learned. The framework will promote broad-based development initiatives (research, policies etc.) that reach the small/medium and commercial farmers.

Policy

- Assist with rectifying policy shortcomings that create distributional bottlenecks at the state and national level, in an attempt to address the surplus storage-large scale malnourishment dilemma (India).
- Removal of barriers to entry in the import, export and agroprocessing sectors.

Food Security

- Targeted interventions that reach the most vulnerable, chronically food insecure areas, and raise rural incomes: food-for-work programs, micro-enterprise, association/cooperative building, credit.

Institution Building

- Establish links and cooperative arrangement with local agricultural universities and their U.S. counterparts, conducting research and exchanging ideas in: policy, technology, human/resource management.
- Judicial and regulatory assistance to ensure investors have legal recourse.

Biotechnology and Information Technology

- Promote the already existing local capacity in this area to reach its full potential, and support partnerships with U.S. private sector and educational institutions.

Water and Irrigation

- Regional water sharing, conservation, preventing/reducing damage of floods, salinity and waterlogging, and small/medium scale irrigation programs.

East/Southeast Asia

This region is comprised of countries well on their way toward economic development and others that have not reached their full potential due to mismanagement or political isolation. Recovery from the 1997 financial crisis varies between the affected countries. Also significant is the internal unrest and democratic growing pains in Indonesia and the Philippines. The USAID

agriculture framework will promote competitiveness along the value chain and trade, taking into account changing demand due to increasing incomes.

Policy

- Judicial and regulatory assistance to ensure investors have legal recourse.
- Trade—assistance to conform to WTO regulations: regional trade enhancement, bilateral trade agreements.

Information Technology and Biotechnology

- Further develop local capacity, form synergies with international research centers/donors, and establish links with U.S. private and educational institutes.

Environment and Water

- Promote conservation forest, land and water depleted by logging, encroachment and unsustainable agriculture.

Targeted Interventions

- Bridge gap between and within countries in the region by targeting rainfed and marginalized areas, promoting s technology transfer and specialization into high-value crops.

Globalization

- Assist with meeting grades & standard requirements, phytosanitation harmonization.

VII. Next Steps

The changing economic and political landscape at home and abroad calls for new ways of conducting business in the development arena. U.S. government priorities are shifting. Similarly, other bilateral and multilateral donors are also modifying their activities. Historically, the U.S. has played a large role—with proven results—in agriculture in ANE through support for international research institutions, measure that helped spread the green-revolution technology, food aid, and the development of agricultural universities throughout the region. Because of this legacy, the U.S. is still able to exhort influence with donors and recipients that far out outweigh its current monetary contributions

Globalization has opened up borders, broken down trade barriers, and is putting pressure on countries that resist. The private sector—the driving force of globalization—is investing in new ventures and moving into the domain that was traditionally public. Civic and religious organizations are increasingly active in development efforts. While these groups represent various interests with sometimes conflicting agendas, their influence at the national and local levels cannot be denied. It is in such an environment that the ANE Bureau hopes to form partnerships and leverage funding with players who have vested interests in the region. To this end, the Bureau will consider pursuing the following:

- Encourage ANE missions to reevaluate ongoing programs and strategize to include appropriate agriculture activities within their portfolios, as appropriate.
- Collaborate with other U.S. government agencies—USDA, USTR, Commerce, and EPA—to support international agriculture development efforts.

- Collaborate with other donors—e.g., explore developing an Agriculture Sector Investment Program (ASIP) type activity, which focuses donor efforts in the sector in a coordinated manner, and helps prevent local counterpart capacity from being over-stretched. Another option would be for USAID to specialize its funding so that other donors feel they have their complementary niche, not compete over the same areas with different approaches.

Table 1

Food Availability, Prevalence and Depth of Undernourishment and Access to Food (1996-98)

REGION, SUB-REGION, COUNTRY	FOOD AVAILABILITY	PREVALENCE OF UNDERNOURISHMENT		DEPTH OF UNDER- NOURISHMENT	ACCESS TO FOOD
		Proportion population undernourish ed 1996-98 (%)	Number of under- nourished 1996-98 (million)		
Average per capita dietary energy supply 1996-98 (kcal/day)				Average food deficit per person 1996-98 (kcal/day)	GNP per capita 1996-98 (constant U.S. \$)
DEVELOPING WORLD	2716	18	791.9	255	1205
ASIA AND THE PACIFIC	2791	17	515.2	263	866
East Asia	2946	12	155.0	245	1156
China (Main and Taiwan) [3]	2940	11	140.1	250	667
China,H.Kong SAR [1]	3200	*	0.1	140	22778
Korea DPR [5]	1860	57	13.2	340	...
Korea Rep [1]	3120	*	0.5	130	11422
Mongolia [5]	1960	45	1.1	310	397
Oceania	2140	29	1.3	260	1023
Papua N Guinea [4]	2140	29	1.3	260	1023
Southeast Asia	2385	13	64.7	233	1280
Cambodia [4]	2060	33	3.4	270	279
Indonesia [3]	2470	6	12.3	200	1019
Laos [4]	2190	29	1.5	280	411
Malaysia [1]	2430	*	0.5	140	4278
Burma [3]	2300	7	3.1	200	...
Philippines [4]	2060	21	15.2	270	1150
Thailand [4]	2880	21	12.2	260	2760
Viet Nam [4]	2120	22	16.5	280	309

REGION, SUB-REGION, COUNTRY	FOOD AVAILABILITY	PREVALENCE OF UNDERNOURISHMENT		DEPTH OF UNDER- NOURISHMENT	ACCESS TO FOOD
		Proportion population undernourish ed 1996-98 (%)	Number of under- nourished 1996-98 (million)		
	Average per capita dietary energy supply 1996-98 (kcal/day)			Average food deficit per person 1996-98 (kcal/day)	GNP per capita 1996-98 (constant U.S. \$)
South Asia	2778	23	294.2	291	425
Bangladesh [5]	2890	38	46.8	330	347
India [4]	2830	21	207.6	290	424
Nepal [4]	2390	28	6.2	270	219
Pakistan [4]	2440	20	28.9	270	489
Sri Lanka [4]	2410	25	4.5	260	763
NEAR EAST AND NORTH AFRICA	2907	10	35.9	177	1952
Near East	2738	13	30.3	165	2358
Afghanistan [5]	1620	70	14.6	470	...
Jordan [3]	2790	5	0.2	170	1470
Lebanon [1]	3270	*	0.1	160	2926
Yemen [5]	2050	35	5.7	290	226
North Africa	3180	4	5.6	195	1297
Algeria [3]	2980	5	1.4	190	1438
Egypt [2]	3280	4	2.6	200	1113
Morocco [3]	3130	5	1.4	210	1311
Tunisia [1]	3260	*	0.1	130	2097

NOTES: TABLE 1

Figure in brackets [] denotes prevalence category, i.e., proportion of the population undernourished in 1996-98.

Category

[1] <2.5% undernourished

[2] 2.5-4% undernourished

[3] 5-19% undernourished

[4] 20-34% undernourished

[5] = or > 35% undernourished

*** : percentage of undernourished below 2.5%**

... Data unavailable

SOURCES:

Average dietary energy supply (DES) FAO estimates.

Average food deficit per person FAO estimates.

GNP per capita (in constant U.S.\$) World Bank, World Development Indicators, 2000 Edition.

Number of undernourished FAO estimates.

Undernourished in total population FAO estimates.

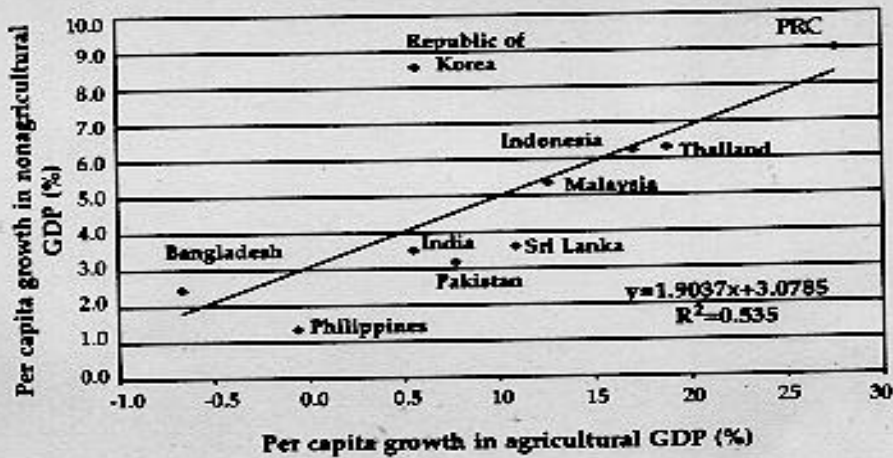
The above table is from the “Assessment of the World Food Security Situation”, Committee on World Food Security of the FAO at its 26th Session, 18-21 September 2000, Rome.

N.B. Data are presented for USAID presence and non-presence countries, if available. Other countries have been added to serve as comparisons.

Figure 1

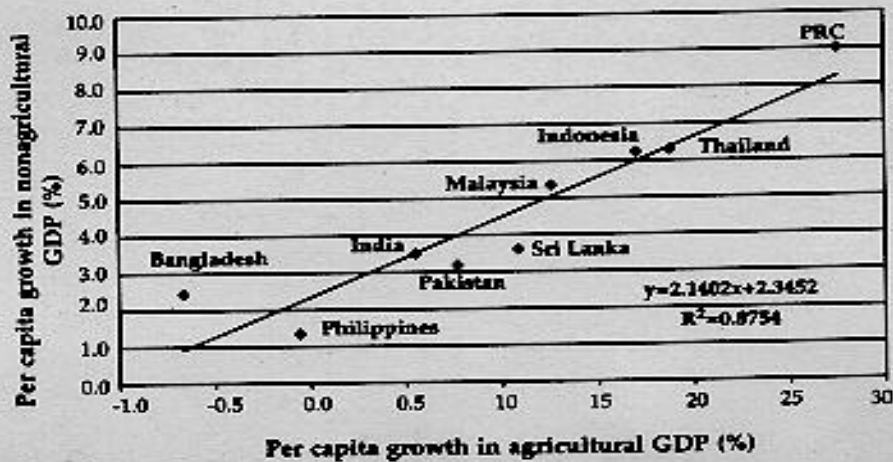
Growth relationship between agriculture, and that of the manufacturing & service sectors

Figure I.3: Per capita growth rate, nonagricultural vs. agricultural GDP (with Republic of Korea), 1970-95



Note: Growth rates are 3-year centered moving averages.
Source: WDI 1998 and FAO FAOSTAT 1998

Figure I.4: Per capita growth rate, nonagricultural vs. agricultural GDP (without Republic of Korea), 1970-95



Note: Growth rates are 3-year centered moving averages.
Source: WDI 1998 and FAO FAOSTAT 1998

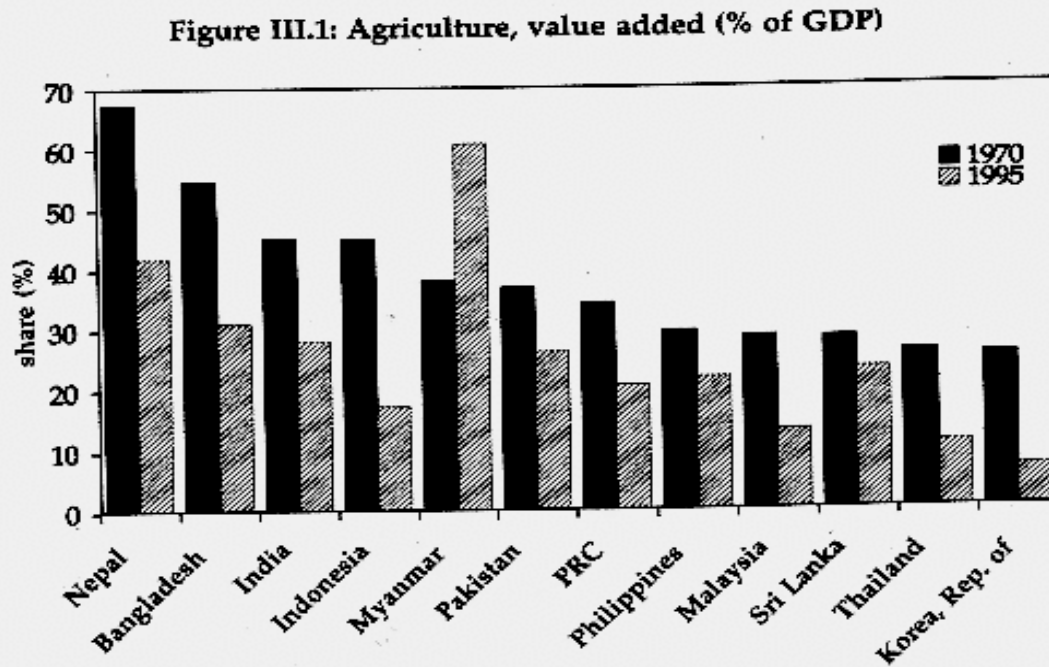
Source: as presented in Rosegrant & Hazell, 2000

Table 2 ANE Bureau Agriculture Obligations. (Note: does not include food aid)

	DA toward Agriculture ('000 \$)			ESF toward Agriculture ('000 \$)			Total Agriculture ('000 \$)			Total ANE Allocations ('000 \$)			Agriculture as a percentage of Total		
<i>year</i>	<i>2000</i>	<i>2001</i>	<i>2002*</i>	<i>2000</i>	<i>2001</i>	<i>2002*</i>	<i>2000</i>	<i>2001</i>	<i>2002*</i>	<i>2000</i>	<i>2001</i>	<i>2002*</i>	<i>2000</i>	<i>2001</i>	<i>2002*</i>
Egypt	0	0	0	70843	63390	56556	70843	63390	56556	727267	693471	655000	9.7%	9.1%	8.6%
Jordan	0	0	0	28000	14520	20000	28000	14520	20000	199500	149670	150000	14.0%	9.7%	13.3%
Lebanon	0	0	0	5000	5700	6000	5000	5700	6000	15000	34923	35000	33.3%	16.3%	17.1%
Morocco	0	0	0	0	0	0	0	0	0	10250	11167	10813	0.0%	0.0%	0.0%
West Bank	0	0	0	0	0	0	0	0	0	485000	84813	72000	0.0%	0.0%	0.0%
Yemen	0	0	0	0	0	0	0	0	0	0	3991	5000	#	0.0%	0.0%
Near East	0	0	0	103843	83610	82556	103843	83610	82556	1437017	978035	927813	7.2%	8.5%	8.9%
Bangladesh	3101	2200	2200	0	0	0	3101	2200	2200	45899	57800	64800	6.8%	3.8%	3.4%
India	0	337	337	0	0	0	0	337	337	51450	58527	77550	0.0%	0.6%	0.4%
Nepal	0	1000	500	0	0	0	0	1000	500	16900	20547	30050	0.0%	4.9%	1.7%
Pakistan	0	0	0	0	0	0	0	0	0	3000	0	624000	0.0%	#	0.0%
Sri Lanka	0	0	0	0	0	0	0	0	0	3550	3300	8300	0.0%	0.0%	0.0%
South Asia	3101	3537	3037	0	0	0	3101	3537	3037	120799	140174	804700	2.6%	2.5%	0.4%
Burma	0	0	0	0	0	0	0	0	0	6500	6492	6500	0.0%	0.0%	0.0%
Cambodia	0	0	0	0	0	0	0	0	0	13550	26935	35000	0.0%	0.0%	0.0%
China	0	0	0	0	0	0	0	0	0	1000	0	5000	0.0%	#	0.0%
East Timor	0	0	0	8100	8072	9000	8100	8072	9000	25500	24945	25000	31.8%	32.4%	36.0%
Indonesia	5317	7850	5663	0	0	0	5317	7850	5663	94500	120007	124084	5.6%	6.5%	4.6%
Mongolia	0	0	0	0	0	0	0	0	0	6000	11974	12000	0.0%	0.0%	0.0%
Philippines	2000	1000	1000	0	3211	7000	2000	4211	8000	29700	46055	71059	6.7%	9.1%	11.3%
Vietnam	0	0	0	0	0	0	0	0	0	2750	5094	11100	0.0%	0.0%	0.0%
Southeast/ East Asia	7317	8850	6663	8100	11283	16000	15417	20133	22663	179500	241502	289743	8.6%	8.3%	7.8%
ANE regional	0	1000	0	0	0	0	0	1000	0	124542	173654	132099	0.0%	0.6%	0.0%
ANE Total	10418	13387	9700	111943	94893	98556	122361	108280	108256	1861858	1533365	2154355	6.6%	7.1%	5.0%

(* figures for year 2002 represent budget requests)

Figure-2. Agriculture's share of GDP



Source: WDI 1998.

Table III.1: Agriculture, Value Added (% of GDP)

Year	1966	1970	1975	1980	1985	1990	1995
Bangladesh	53.95	54.56	61.95	49.64	41.77	36.85	30.88
India	44.94	45.17	40.50	38.10	33.03	30.97	27.87
Indonesia	50.81	44.94	30.18	23.97	23.24	19.41	17.16
Korea, Rep. of	34.12	25.37	24.13	14.53	12.49	8.68	6.54
Malaysia	28.32	28.52	27.98	21.91	19.30	18.72	13.02
Myanmar	34.40	38.00	47.07	46.54	48.20	57.26	60.63
Nepal	70.51	67.29	71.76	61.77	51.71	51.63	41.77
Pakistan	37.07	36.83	32.05	29.52	28.53	25.98	26.02
Philippines	25.69	29.52	30.34	25.12	24.58	21.90	21.62
PRC	36.06	34.13	31.97	30.09	28.35	27.05	20.59
Sri Lanka	28.30	28.30	30.35	27.55	27.69	26.32	23.01
Thailand	33.40	25.92	26.87	23.24	15.81	12.74	10.84
Viet Nam	-	-	-	-	-	37.47	27.55

Source: WDI 1998.

Source: as presented in Rosegrant & Hazell, 2000

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